Ontario

Ontario Ministry of Agriculture and Food

2002 SUPPLEMENT

Flue-Cured Tobacco Production Recommendations

Publication 298S

This supplement contains changes/additions/deletions to Publication 298. For complete recommendations, refer to the original publication and include these changes. The OMAF Web site has been changed to www.gov.on.ca/omaf to reflect the recent change in the ministry name.

Chapter 2. Soil Management and Fertilizer Use

Excessive nitrogen rates and nitrogen applied late in the season can produce tobaccos with unbalanced leaf chemistries. For this reason, the following paragraph has been changed.

Page 18.

Field fertilization — Nitrogen section:

REMOVE — Second paragraph.

REPLACE WITH — Previous tobacco crops usually provide the most reliable basis for determining the nitrogen requirement. Keep a yearly record of each field to get an accurate picture of maturity, size, quality, and yield. The amount of nitrogen applied to previous tobacco crops can then be used as a guide. An adjustment of at least 4 kg/ha of nitrogen at transplanting is usually required to make any significant change in the crop. **Application of nitrogen rates in excess of recommendations, and nitrogen applied after the last cultivation, have been shown to result in undesirable leaf quality, especially in the upper leaves.**

Chapter 3. Recommended Varieties

Four new varieties, CT 572, CT 144, RG 81 and RG 17 have been registered and can now be grown in Canada. CT 572 and CT 144 were developed in Canada and released by the Canadian Tobacco Research Foundation's breeding program. RG 81 and RG 17 were developed and first registered in the United States. They have been tested in Canada and have performed well under our growing conditions. RG 81 and RG 17 have a 2-year Canadian registration ending in January 2004.

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ADD — **CT 572** was registered in 2001. CT 572 is derived from a cross between a Canadian breeding line TB5-2 and an American variety K149. CT 572 has been tested for several years in preliminary and advanced trials. In the last 3 years of regional testing CT-572 yielded about 280 kg/ha (250 lbs. /acre) more cured leaf than Delgold and Delfield. Days to topping are about 1–2 days longer and it has 1–2 leaves more than Delgold. CT 572 produces more "M" grades but slightly less "O" grades than Delfield and Delgold. In wet years, this variety is easily distinguishable from others by the brown spot symptoms commonly seen in the bottom leaves, but the spots have no impact on both yield and quality of the crop. Tolerance to black root rot is similar to standard check varieties and is less susceptible to blue mold. CT 572 produced excellent leaf quality tobacco and buyers ratings where higher than Delfield and Delgold.

ADD — **CT 144** was registered in 2001. CT 144 is derived from a cross between Canadian breeding line TB5-2 and the American variety K326. CT 144 has

been tested for several years in preliminary and advanced trials. In the last 3 years of regional testing CT144 produced a slightly higher yield than Delgold and Delfield. Days to topping are 1 day longer, and have 2 more leaves than Delgold. Plant height and sucker weight is similar to Delfield and Delgold. CT 144 produces more "O" and "L" grades than Delfield and Delgold. Brown spots in the bottom leaves was observed on wet years, but had no impact on yield and quality of the crop. CT 144 has good tolerance to black root rot and blue mold. The buyers ratings where higher than Delgold.

ADD — **RG 81** is a conventional variety registered in the United States. It was developed from crosses between K 326 and K 399. The 3-year average of the results from the trials in 1998, 1999 and 2000 indicates that RG 81 provides a higher grade index than Delgold and Delfield. In other comparisons to Delgold and Delfield, RG 81 is similar in yield and black root rot tolerance, approximately two days later topping and slightly shorter in plant height. The leaves tend to be smaller than Delgold and Delfield. As for grade mix, total "O&M" grades are higher and "F", "G" and "CR" grades are lower than the average of Delgold and Delfield. The company rating for RG 81 is similar to Delfield but higher than Delgold.

ADD — **RG 17** is a variety registered in the United States. It is from a cross between K 326 and K 399. The 3-year average of the results from the trials in 1998, 1999 and 2000 indicates that RG 17 has a comparable grade index to Delgold and Delfield, but the yield is slightly lower. In other comparisons days to topping is 2 days longer than Delfield and Delgold, it is a much shorter plant, but has the same number of leaves as Delfield. It has less ground suckers than any of the varieties and has an average black root rot rating. As for grade mix, total "O&M" grades are higher and "F", "G" and "CR" grades are lower than the average of Delgold and Delfield. The company rating for RG 17 is similar to Delfield but higher than Delgold.

TABLE 3.1 Tobacco Variety Performance (3-year average, 1999-2001) *NEW*

Variety	Yield (kg/ha)	Grade index (¢/kg)[1]	Number of leaves	Days to topping	Topping height (cm)	Area 3 tip leaves (cm^2)	Ground suckers (kg/ha)[2]	Black root rot index[3]	Percent O & M grades	Company evaluation[4]
AC Cheng	3,061	474	17	64	95	1,126	4	4.7	39	67
AC Gayed	2,913	453	17	62	93	1,089	11	8.4	26	68
AC White	3,247	463	18	66	97	1,038	8	4.5	38	72
CT 157	2,840	492	18	67	99	1,005	10	4.4	61	84
CT 166	3,155	470	18	65	97	1,088	19	4.0	35	68
CT 681	3,177	461	17	66	96	1,083	9	8.3	36	72
Delfield	3,076	476	17	63	96	1,062	16	4.4	53	72
Delgold	3,154	467	18	63	96	1,041	11	4.4	41	72
Delliot	3,037	465	17	64	103	1,067	16	5.5	27	67

[1] Prices are based on 1999 grade price.
[2] Ground suckers (kg/ha) data was collected during mid-July, shortly after hilling.
[3] High number = more tolerance
[4] Rating is based only on visual attributes of the cured leaf. Higher number = better rating

TABLE 3.2 Tobacco Variety Performance (1-year data, 2001) *NEW*

Variety	Yield (kg/ha)	Grade index (¢/kg)[1]	Number of leaves	Days to topping	Topping height (cm)	Area 3 tip leaves (cm^2)	Ground suckers (kg/ha)[2]	Black root rot index[3]	Percent O & M grades	Company evaluation[4]
AC Cheng	3,662	479	19	67	104	1,254	8	3.8	48	68
AC Gayed	3,522	458	17	63	94	1,251	26	8.0	25	71
AC White	3,958	476	19	69	103	1,084	10	3.2	53	78
CT 157	3,610	495	19	69	108	1,073	30	3.6	71	88
CT 166	3,841	457	19	67	103	1,125	38	3.5	33	66
CT 681	4,049	468	19	69	101	1,207	17	8.8	50	84
Delfield	3,756	482	18	65	98	1,169	29	3.7	60	69
Delgold	3,799	469	19	67	101	1,123	21	3.3	52	72
Delliot	3,659	454	17	68	112	1,138	3	3.9	14	65
CT 572	3,985	495	19	70	99	1,047	16	4.3	83	87
CT 144	3,875	490	19	70	103	1.024	19	4.7	53	76

[1] Prices are based on 1999 grade price.
[2] Ground suckers (kg/ha) data was collected during mid-July, shortly after hilling.
[3] High number = more tolerance
[4] Rating is based only on visual attributes of the cured leaf. Higher number = better rating.

REMOVE — Table 3.1 Tobacco variety performance (2-year average, 1999-2000)

ADD — Table 3.1 Tobacco Variety Performance (3-year average, 1999-2001) *NEW (previous page).*

ADD — Table 3.2 Tobacco Variety Performance (1-year data, 2001) *NEW*

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Chapter 4. Seedling Production

Page 37. Fertilization — Soluble Salts, Correcting salt problems section:

REMOVE — Samples of muck from the seedbed may be tested at the Southern Crop Protection and Food Research Centre in Delhi to determine the level of soluble salts.

REPLACE WITH — Samples of muck from the seedbed can be tested for soluble salts at the OMAF-accredited labs listed on page 17.

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Chapter 5. Weed Management

Page 42. Fluazifop-p-butyl:

REMOVE — Trade Name: Fusilade II.

REPLACE WITH — Trade Name: Venture L.

Chapter 6. Field Production

Page 49. Disease Control — Black root rot:

ADD — Chloropicrin, a multi-purpose soil fumigant.

TABLE 6.4 Multi-Purpose Fumigant Treatments

	Row	
	L/ha (107 cm rows)	*mL/100 m of row
Telone C-17	75-100	803-1,070
Vorlex Plus CP	50-80	535-856
Vorlex Plus	56-90	599-963
Chloropicrin 100	28	280

* mL/100 m of row remains the same regardless of row width

Fumigants containing chloropicrin (Telone C-17, Vorlex Plus CP, and Chloropicrin 100) are more effective than other fumigants in reducing black root rot.

The rate of application should vary within the recommended ranges according to the likely severity of the black root rot. Account for contributing factors such as the field history of black root rot, cropping sequence, type of soil and tolerance of variety to be grown.

Page 50. Disease Control — Blue Mold: Control

ADD — Fungicide Recommendations

Aliette WDG and Acrobat MZ are recommended for the control of blue mold in the field if blue mold is reported in Ontario tobacco crops. Ridomil is not recommended, since strains of blue mold resistant to Ridomil exist.

If you wish to take a proactive approach in reducing the risk of disease you can do so now by following the application techniques for Acrobat MZ or Aliette WDG outlined below.

Remember that Acrobat MZ and Aliette WDG are preventative products and should be used before infection occurs. Treating a crop once the disease has already established will not be as effective in controlling the disease. After the first preventative application of either product, further preventative applications are required to ensure effective protection and follow the label regarding the pre-harvest intervals. Implementing a preventative spray program will not guarantee total control of blue mold, but it should help reduce the amount of infection to a more manageable level if the disease occurs. **Follow the label regarding the pre-harvest intervals.**

Important factors to help prevent blue mold infection

1. Start spraying before blue mold infects your crop.
2. Calibrate your sprayer before applying the product.
3. Use the proper nozzles and arrangement of nozzles for the stage of tobacco being treated to optimize full coverage of the entire tobacco plant.
4. Use the product at the recommended rate as outlined on the product label.

Application Techniques for Fungicide Control of Blue Mold on Tobacco

Thorough coverage of tobacco plants when applying fungicides can be obtained with the following application techniques when using a hydraulic-type sprayer, such as the Hahn "Hi-Boy". The spray boom arrangement requires a single nozzle centred over the tobacco row for early applications. Later applications require additional nozzles mounted on drop pipes, centred between the rows on either side of the centre nozzle, and aimed at plants on either side of the drop pipes. Mount the drop nozzles on a swivel to allow small adjustments in mounting angle to obtain the best coverage at various growth stages. This nozzle arrangement is required for each tobacco row sprayed.

TABLE 6.11 Guidelines for the Application of Aliette [1, 2, 3]

Stage of Tobacco	Amount of Mixture to be Sprayed	Amount of Actual Product Applied	Nozzle Number and Nozzle Arrangement
Early Plant Growth Early to mid-June up to 25 cm (10 in.) in plant height	112 L/ha (45 L/acre)	0.75 kg product/ha (0.66 lb./acre)	Minimum of 1 nozzle
Mid Growth Stage Late June to early July from 25–36 cm (10–14 in.) in plant height	170 L/ha (69 L/acre)	1.125 kg product/ha (1.0 lb./acre)	Minimum of 1 nozzle
from 36–70 cm (14–28 in.) in plant height	315 L/ha (127 L/acre)	2.125 kg product/ha (1.9 lb./acre)	Minimum of 3 nozzles
Late Growth Stage Mid-July 70 cm (28 in.) in plant height to topping stage	450–560 L/ha (182–227 L/acre)	3 kg product/ha (2.67 lb./acre)	Up to 5 nozzles

[1] Use product at the recommended rate as outlined on the product label.
[2] For Aliette, total product allowed per season is 10 kg/ha or 8.9 lb./ac.
[3] Do not apply within 5 days to harvest.

TABLE 6.12. Guidelines for the Application of Acrobat MZ [1, 2, 3]

Stage of Tobacco	Amount of Mixture to be Sprayed	Amount of Actual Product Applied	Nozzle Number and Nozzle Arrangement
Freshly transplanted tobacco (0–3 weeks after planting)	110 L/ha (45 L/acre)	0.49 kg product/ha (0.44 lb./acre)	Minimum of 2 nozzles (See Figure 6.1)[4]
Mid-sized tobacco (Knee high)	220 to 330 L/ha (89–134 L/acre)	1 to 1.5 kg product/ha (0.9–1.3 lb./acre)	5 nozzles (See Figure 6.2)[4]
Large-sized tobacco (Waist high or taller)	440 to 560 L/ha (178–227 L/acre)	2 to 2.5 kg product/ha (1.8–2.2 lb./acre)	7 nozzles (See Figure 6.3)[4]

[1] Use product at the recommended rate as outlined on the product label.
[2] For Acrobat MZ, total product allowed per season is 5 kg/ha or 4.45 lb./ac.
[3] Do not apply within 21 days to harvest.
[4] Spray configuration that was found to be effective.

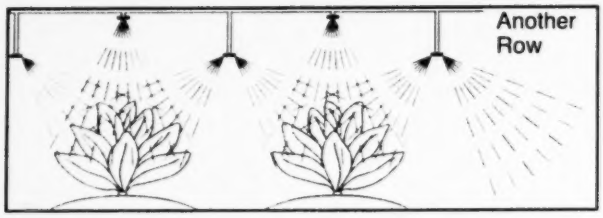

Figure 6.1 Sprayer nozzle configuration for freshly transplanted tobacco (0–3 weeks after planting).

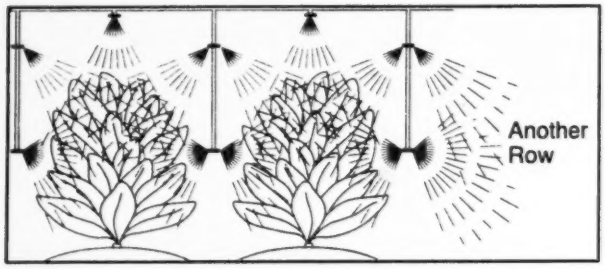

Figure 6.2 Sprayer nozzle configuration for mid-sized tobacco (knee high).

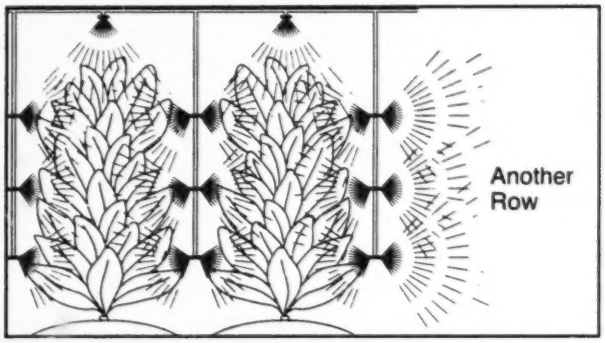

Figure 6.3 Sprayer nozzle configuration for large-sized tobacco (waist high or taller).

Figures courtesy of BASF, reprinted with permission.

Page 50. Disease Control — Blue Mold: Control

REMOVE — When needed, preventative measures approved by the Blue Mold Task Force will be recommended. Contact an OMAF tobacco specialist for information.

REPLACE WITH – When needed, **additional** preventative measures approved by the Blue Mold Task Force will be recommended. Contact an OMAF tobacco specialist for information.

Page 51. Insect control — Cutworms: At or after planting

REMOVE — Paragraph under "At or after planting" and Table 6-7.

REPLACE WITH — Insecticides may be overall or band applied at or after planting. The rates in Table 6.7, *Treatment for Cutworms — At or After Planting* are per treated hectare. When band spraying, a treated hectare is not the same as a crop hectare. For example, 1 treated hectare would be equivalent to 4 crop hectares when spraying a 25 cm band on a 1 m row spacing.

TABLE 6.7 Treatment for Cutworms — At or After Planting

	Amount per treated ha	Pre-harvest interval (days)
Ripcord 400 EC	175 mL	60
Orthene 75% SP	1.5 kg	3
Decis 5 EC	200 mL	70
Pounce 384 EC	175 mL	55
Cymbush 250 EC	280 mL	*

* Use only at planting

Recycle old editions of this publication. Each year the appropriate working group of the Ontario Pest Management Research and Services Committee reviews the pesticides listed in this publication. To the best knowledge of the committee, at the time of printing, all of these pesticides were:

- federally registered
- reviewed by the Ontario Pesticides Advisory Committee (OPAC)
- classified by the Ministry of Environment and Energy as of August 2002.

The information in this publication is general information only. By printing this publication, the Ministry of Agriculture and Food does not offer any warranty or guarantee, nor does it assume any liability for any crop loss, animal loss, health, safety or environmental hazard caused by the use of a pesticide mentioned in this publication.

The pesticide product label is a legal document. It is against the law to use the product in any other way. You must also use all pesticides in accordance with the *Pesticides Act* and Regulation 914, administered by the Ontario Ministry of Environment and Energy.

In this publication, most recommendations list several pesticides that can be used for each pest discussed. In general the least hazardous materials and those pesticides that pesticide applicators have used satisfactorily for years are listed first. More toxic pesticides and/or newer ones with less practical grower experience follow.

This publication lists a number of brand names of pesticides. This is for your convenience only. It is neither an endorsement of the product nor a suggestion that similar products are ineffective.

Consult each product label for specific information such as compatibility with other materials and the effect of environmental conditions. Weather and other factors influence the effectiveness of pesticides and the likelihood of crop injury.

Health Canada has established maximum residue limits (MRLs) for pesticides. Processors or retailers may demand more restrictive limits. Growers should seek advice of their intended market as to which restrictions or limitations apply. Keep accurate and up-to-date records on pesticide use in each crop.

Federal Registration of Pesticide Products

The Pest Management Regulatory Agency (PMRA) of Health Canada grants registration following an evaluation of scientific data to ensure that the product has merit and value; and the human health and environmental risks associated with its proposed use are acceptable.

1. Full Registration

Pesticide registrations are normally granted for a period of five years, subject to renewal.

2. Temporary Registration

Temporary registration may be granted for a period not to exceed one year, where the registrant agrees to produce additional scientific or technical information, or the pesticide is used for emergency control of a serious pest outbreak.

Supplemental Labels

You MUST obtain a supplemental label and follow all the label directions when PMRA approves new uses for a registered pesticide that do not appear on the current label.

Examples of when you must use a supplemental label include:

- **Temporary Registrations for Emergency Use**
- **Minor Use Label Expansion** (new label statements for crops that do not already appear on that product label)

You can obtain a copy of a supplemental label from the pesticide manufacturer or pesticide vendor, the grower association that sponsored the emergency registration or minor use, from OMAF or PMRA's Pest Management Information Service.

For more information on the federal registration status check the PMRA web site at www.hc-sc.gc.ca/pmra-arla or call **1-800-267-6315.**

Regulation of Pesticides in Ontario

Classification of Pesticides into "Schedules"

The Ministry of Environment and Energy classifies all pesticide products into one of six schedules, based on the potential hazards that product may have for human health and the environment. For up-to-date information on the regulatory status of any pesticide check the Ontario Pesticides Advisory Committee Web site at www.opac.gov.on.ca or call (416) 314-9230/ fax (416) 314-9237.

Licensing and Certification Requirements for Pesticide Users

You must be a certified grower or licensed exterminator to buy and use Schedule 1, 2 and 5 pesticides.

Requirements for Growers and their Assistants

Growers must be certified through the Grower Pesticide Safety Course to buy and use Schedules 1, 2 or 5 pesticides on land they farm. There must be at least one certified grower for each farm operation.

All agricultural assistants must also receive formal pesticide safety training, recognized by the Ministry of Environment and Energy, before they can use Schedule 2 or 5 pesticides under the supervision of a certified grower. This applies to all assistants — including family members, farm employees and seasonal workers.

For more information about training for growers and agricultural assistants check the Ontario Pesticide Education Program Web site at www.ridgetownc.uoguelph.ca/opep/ or call 1-800-652-8573.

Requirements for Commercial Applicators and their Assistants

If you plan to apply pesticides as a business, you must be a licensed exterminator. This includes farmers who custom apply pesticides for other farmers and charge a fee for this service. You must complete a home study course and certification exam, and send proof of certification to the Ministry of Environment and Energy to obtain your license.

Unlicensed assistants must be Technicians before they may handle Schedule 2 (with restrictions), 3, 4 and 6 products under indirect supervision of a licensed exterminator. Technicians may not handle Schedule 1 and 5 products. For more information about exterminators and technicians check the Ontario Pesticide Training and Certification Web site at www.ridgetownc.uoguelph.ca/optc or call 1-888-620-9999.

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